the content of each rule. Similarly, both the division of the work into three books and the titles thereof are based on the formal and material considerations expressed in places such as Rules 8 and 12.

As far as the present translation is concerned, the main aim has been to achieve a version that, with respect both to style and to substance, would be *both as literal as possible and as liberal as necessary*. Since I have made more systematic remarks about the philosophy of translating elsewhere,[259] I only want to reiterate here my prevailing thought that, in so far as the thesis of 'the indeterminacy of translation' is taken to be applicable to the translation of the signs of one language into those of another, this thesis cannot be verified or falsified in general, but rather only in particular. Claims without cases are empty, and cases without claims are blind.[260]

The selective index is easy to use. Its numbers refer to the pages in the edition of Adam and Tannery, and, once again, these page numbers are provided in the square brackets in the margin of the Latin text of the edition. One should note that the data for the comparative and superlative forms of adjectives and of adverbs are to be found among the data for the simple forms.

The English-Latin glossary is equally easy to use. Its main aim is to serve those readers who will be tracing entries via the translation, whereas the index must, of course, relate directly and immediately to the original.

Since it is axiomatic that every text has its context, one should not expect absolute completeness or total consistency in the 'correspondences' – for lack of a better term – between the index, the glossary, and the texts. A small amount of overlapping and of underlapping is ineradicable.

To be sure, the bibliography is restricted to books and to monographs; none the less, given the very well-anthologized state of the literature on Descartes in articles, this is perhaps not an acute flaw.

[259] See Josef Simon, *Philosophy of the Sign*, trans. G. Heffernan (Albany, 1995), pp. 4–10 (of the Translator's Introduction).

[260] In his review of my pilot bilingual edition of Descartes' *Meditationes de prima philosophia / Meditations on First Philosophy* Roy Martinez claims that the translation is done 'with an English that is wanting in syntax' (*Teaching Philosophy* [ed. Arnold Wilson], vol. 16, no. 2 [June, 1993], p. 184). Hoping to render his generalization plausible, Martinez cites – aside from an isolated example of the subjunctive that is a matter of taste – only a fragment of a single sentence (ibid., ll. 15–16). Yet the complete translation of the sentence at issue, from Meditation III (§ 17), reads thus: 'But of these my ideas, besides that one which exhibits me myself to me – about which there can be no difficulty here –, there is another one, which represents God, there are others, which represent corporeal and inanimate things, others, which represent angels, others, which represent animals, and finally others, which represent other human beings similar to me.' As the reviewer might have recognized had he read beyond the second dash – where his quotation of my rendition inexplicably ends –, there is nothing syntactically deficient about this translation. Of course, this is not to say that it cannot be improved; on the contrary, it is already being revised. In fact, however, scholars actively engaged in research on Descartes' philosophy do not appear generally to share the opinion of Martinez. See, e.g., Kenneth P. Winkler, 'Descartes and the Names of God', *American Catholic Philosophical Quarterly: Descartes*, ed. Stephen Voss, vol. LXVII, no. 4 (Autumn, 1993), pp. 451–466, p. 453, fn. 9; Stephen I. Wagner, 'Descartes' Wax: Discovering the Nature of Mind', *History of Philosophy Quarterly: Descartes*, vol. 12, no. 2 (April, 1995), pp. 165–183, fns. 10, 13, and 14; etc. In any case, my translation techniques are completely consistent with the theory and praxis of such experts as Werner Koller – see his *Einführung in die Übersetzungswissenschaft* (Heidelberg/Wiesbaden, 1979/1992).

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I alone am fully responsible for any errors or flaws or idiosyncrasies that might remain.[261] May the readers be kind enough to point them out to me, thereby making their own contributions to the improvement of the edition.[262] For this I wish to express my gratitude in advance.

[261] Since having to answer for one's own errors is enough already without having to worry about those of others as well, I wish to note that my bilingual edition of the *Discours de la méthode / Discourse on the Method* was reproduced from camera-ready copy; that I submitted a correct title-page; and that the errors in the French on the printed title-page are the result of the fact that the publisher altered the submitted page, which had been designed exactly to their specifications, without consultation and without proof-reading.

[262] P.S.: On second thought, it may not have been acceptable to bracket out, from the inquiry into 'ingenium' above, the question about the relationship between natural intelligence and artificial intelligence. On the one hand, doing so is justified in so far as the translation of 'ingenium' as '*natural* intelligence' is likely to provoke the question as to what other kind of intelligence there might be in the *Regulæ*. For many philosophers, including Descartes, are familiar with a distinction, however vague and obscure, between the natural and the artificial, and one may jump to the conclusion that in the *Regulæ* he is proceeding from a distinction between natural intelligence and artificial intelligence. Yet nothing could be further from the truth, if only because Descartes is convinced that it is impossible to explain thought or language or intelligence mechanistically (cf., e.g., *Discourse*, pt. V, passim, and esp. §§ 9–12). On the other hand, he would witness the invention, by Blaise Pascal (1623–1662) in 1642, of the first computer in the form of a calculating machine – the first genuine adding machine capable of operating in such a way as to carry tens to the next column. Even as these pages go to press, the second official chess match between a reigning world champion and a computer is ending with Garry Kasparov's loss (1 win, 2 losses, 3 draws) to IBM's Deep Blue (May 11, 1997). But only those who do not read beyond the headlines can regard this as a triumph of artificial intelligence. Rather, the question is what humans must do in order to enable a computer to beat themselves at chess. For C. J. Tan and his IBM team had two alternative approaches to a solution to the problem of how to program a computer to play against a grandmaster. The first emphasizes pure calculating power, i.e., the computer is made to calculate as many combinations as deeply as possible, in order, after having done so, to find the best line of play. The second stresses getting the computer to be selective, i.e., most moves are screened out from the beginning, in order to concentrate on a few promising lines. After all, the number of possible chess games – 10 to the 120th power – is greater than the number of atoms in the universe. A human of Kasparov's ability selects moves on the basis of experience, analysis, and intuition. Already the first match (1996) showed that Kasparov, the most highly rated player in the history of the game as measured by the official Elo Scale, could not match the computer's calculating capacity. In fact, Deep Blue calculates millions of moves per second and billions per minute. Kasparov, who knew that Deep Blue had been programmed mainly according to the method, not of selectivity, but of force, strived for positions in which the computer would mostly have to make, not tactical decisions based on straightforward calculations, but strategic decisions based on positional intuitions. Thus he won (3 wins, 1 loss, 2 draws). 'Deeper Blue' won the rematch because its calculating capacity was vastly increased, it was taught by a grandmaster (Joel Benjamin) 'to think like a grandmaster', and Kasparov blundered away the decisive game in the shortest defeat of his career. The Cartesian point of all this is that the real power of the machine's artificial intelligence lies in deduction, whereas the true strength of the human's natural intelligence lies both in intuition and in induction. For the *Regulæ* revolve around the comparison of and the contrast between these different modes of inference. And Descartes holds intuition to be epistemically more basic than deduction. Thus the computer has to think like a human being. So natural intelligence remains the standard for artificial intelligence; nor is the latter a model for the former. And Deep Blue's defeat of Kasparov is a victory, not of machine over man, but of man and machine over man alone.

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René Descartes REGULÆ AD DIRECTIONEM INGENII

RULES FOR THE DIRECTION OF THE NATURAL INTELLIGENCE

Latin-English

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REGULÆ

AD DIRECTIONEM INGENII[1]

LIBER I

DE PROPOSITIONIBUS SIMPLICIBUS ET ILLATIONIBUS

Regula I

De sapientia et scientia

Studiorum finis esse debet ingenii directio ad solida et vera, de iis omnibus quae occurrunt, proferenda judicia.

1. Ea est hominum consuetudo, ut, quoties aliquam similitudinem inter duas res agnoscunt, de utraque judicent, etiam in eo in quo sunt diversae, quod de alterutra verum esse compererunt. Ita scientias, quae totae in animi cognitione consistunt, cum artibus, quae aliquem corporis usum habitumque desiderant, male conferentes, videntesque non omnes artes simul ab eodem homine esse addiscendas, sed illum in optimum artifi-
[360] cem facilius evadere, qui unicam tantum exercet, | quoniam eaedem manus agris colendis et citharae pulsandae, vel pluribus ejusmodi diversis officiis, non tam commode, quam unico ex illis possunt aptari; idem de scientiis etiam crediderunt, illasque pro diversitate objectorum ab invicem distinguentes, singulas seorsim et aliis omnibus omissis quaerendas esse sunt arbitrati. In quo sane decepti sunt. Nam cum scientiae omnes nihil aliud sint quam humana sapientia,[2] quae semper una et eadem manet, quantumvis differentibus subjectis applicata, nec majorem ab illis distinctionem mutuatur, quam solis lumen a rerum, quas illustrat, varietate, non opus est ingenia limitibus

[1] A, AT, C, and SGZ: *Regulæ ad directionem ingenii*. H and L: *Regulæ de inquirenda veritate*. N: *Reguln van de bestieringe des verstants*. In the annotations to the Latin text the following abbreviations are employed in order to distinguish between the selected variants of the different editions: 'H' – the Hanover edition (acquired by Leibniz probably in 1678); 'L' – Leibniz' revised version of H (to be dated probably to 1678 and the following years); 'N' – Glazemaker's Dutch translation (1684); 'A' – the first published Latin edition or the Amsterdam edition (1701); 'AT' – the edition in the *Œuvres de Descartes* (vol. X) of Adam and Tannery (1908); 'C' – Crapulli's critical edition (1965/1966); and 'SGZ' – the bilingual Latin-German edition of Springmeyer, Gäbe, und Zekl (1973). For complete information on these editions see the philological section of the introduction and the beginning of the bibliography of the present edition.

[2] H, A, AT, and C: sapientia. SGZ: scientia. N: wijsheit.

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